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ABSTRACT

Studies relating to the characteristics of instructional materials that are adopted for use by teachers are reviewed. Included in the review are studies about: (1) the importance of instructional materials in the classroom; (2) how teachers select instructional materials; (3) theories about instructional materials; (4) attributes of innovations and their adoption; (5) teacher planning; and (6) selection criteria used by teachers. While not much is known about the criteria teachers use to select instructional materials, it appears that student interest and ability are very important to the teacher. Teachers also modify the characteristics or methods of use of instructional materials to fit their perceived needs. There is a great need for teachers to work with educational researchers so that more can be known about teachers' planning, decision making, and material selection processes. Additionally, teachers should be partners with curriculum designers so that designers can be sure that their materials are used properly and that the materials have attributes that teachers find attractive. A nine-page reference list concludes the document. (CB)

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ATTRIBUTES OF INSTRUCTIONAL MATERIALS THAT INCREASE THEIR PROBABILITY OF ADOPTION BY TEACHERS

by

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Attributes of Instructional Materials that Increase Their Probability of Adoption by Teachers

We know very little about what attributes of instructional materials make them attractive to teachers. When we talk about how teachers make choices among these materials, we are examining the area of teacher thinking at the preinstructional or preactive stage. Preactive teacher thinking consists largely of teacher planning.

To the extent that planning is a silent procedure, it is an extremely difficult process to investigate. The lack of literature on teacher planning in general, and teacher selection of instructional materials in particular, may be more due to the apparent difficulty of finding an appropriate research procedure, than to the importance of the topic.

The Importance of Instructional Materials in the Classroom

At least at the elementary level, the most important part of the milieu with which the student interacts is instructional materials. Davis et al (1977), report that ninety-eight percent of the curriculum interactions experienced during a typical day by eleven year olds in grade five classrooms were between the learner and one or more instructional materials. Seventy-eight percent of curriculum interactions in these classrooms were with textbooks. Thirty percent of all other instruction involved non-textbook materials. Since there is such a high frequency of student contact with materials, those

who are concerned with the quality of education would be interested in the criteria used to select these materials.

It seems reasonable that classroom instructional materials would largely be chosen by classroom teachers. In fact, Anderson and Tomkins (1981) suggest that in the 1970's there developed a feeling that tighter control of materials was necessary because education had become too decentralized. It was felt that approval of texts at the school board or higher level would reduce conflict in a pluralistic society. Are teachers the selectors of the materials which they use? In a slight majority of cases, the answer appears to be yes.

A survey by Komoski (1978) found that forty-five percent of American teachers had no direct role in the selection of the instructional materials that were used in their classrooms. It is not clear from Komoski's report whether this forty-five percent of teachers were allowed to choose among a range of texts or other materials that had been narrowed by a committee at the school board or a higher level.

Frequently this large minority of teachers would be making selections, but not from a universe of choices. Some members of the selection committees would be classroom teachers. In any case, a slight majority of teachers do directly choose the instructional materials which they will use.

This paper will examine both how teachers select instructional materials, and how researchers investigate this usually invisible process.

The Contributions of Curriculum Theorists to the Question

Several curriculum theories have given instructional materials (although sometimes called more broadly curriculum materials), a position of importance. Leithwood (1982) suggests that instructional materials would form one of the five elements of curriculum. Each of his elements has five functions: planning, needs assessment, development, implementation, and evaluation. Texts, for example, he sees as being used for selecting objectives, planning and development, and implementation.

At least one writer has included instructional materials in his study of curriculum implementation, or long-term use. Shipman (1974) developed an index of implementation that among other aspects, rated schools on the amount of materials that were in use. He did not examine only the number of different materials. It was acknowledged, for example that integrated studies might involve multiple use of the same material in different ways for different subjects. The material, then, might have a variety of potentials, some not predictable. Ben-Peretz (1975), has especially stressed the importance of curriculum potential both as it applies to curriculum materials and intended and unintended outcomes.

In his survey of curriculum change literature, Fullan (1979) tells us that instructional materials is the most frequently considered area when evaluation of curriculum

change take place. This might be because as Collingwood (1979) notes, the materials are more easily spread and observed than are the ideas behind them. This ease of observability likely accounts for Berman and McLaughlin's (1976) definition of instructional materials as those which bring about change in behavior patterns.

Instructional materials do have an important role in several curriculum theories. Some effort has also been devoted to the construction of theories about instructional materials.

Theories about Instructional Materials

One area of study in curriculum is how teachers look at curriculum. Anderson and Tomkins (1981) are convinced that how one looks at curriculum affects how instructional materials are viewed. The purpose of the curriculum will be matched by the intent of the materials. If it is felt that the development of cognitive processes is more important than the content, then the materials will be inquiry oriented. If the curriculum is to be self-actualizing, the materials will be strongly valued and culture oriented. Great books might be used if the cultural heritage is stressed so that the orientation would be towards the content and the disciplines. An emphasis of social skills might provide us with a contemporary text which serves as repository of information, rather than a structured learning tool.

It may be possible that the relationship between materials and curriculum philosophy is the reverse of that expected by Anderson and Tomkins. Perhaps the attraction of a particular type of material, helps shape the teacher's curriculum philosophy. At the least, a mutual adaptation likely takes place in which curriculum theory and material affect each other.

How a teacher visualizes his role may affect, Zaltman (1977) suggests, what is stressed about an instructional material. The teacher as administrator would emphasize specific discipline areas. The psychological point of view might expect the material to lead to a predictable outcome. The teacher as economist would also anticipate a particular payoff.

Equally interesting would be what the teacher who selected one of these self images might discourage in materials use. The administrator might not encourage an integrative use in different areas. The psychologist would not be open to unintended outcomes. The economist would not favour "non-technocratic" uses of the materials.

Again it might be that the materials of preference helped shape teachers' self images to fit one or several of these roles. Connections among teacher roles and materials use seem logical as described by these authors at the hypothetical level.

Toomy (1977) reported that the four teachers he studied did see different purposes for instructional materials depending

on what role they felt they should play in the instructional process.

The opinion that there is a link between materials used and teacher orientation towards curriculum seems to be worth considering, both because it has been arrived at apparently independently by different theorists, and because at least one researcher has found empirical evidence to support that view.

It may be then, that teachers choose instructional materials that fit their image of what their classroom role should be. While this group of theorists were working from the point of concern of teacher beliefs about curriculum, another set of theories that could be useful to the investigator of teacher selection of materials might be found by examining the theoretical literature on change in education.

Some Attributes Suggested by the Change Literature

In a review of the literature on innovations in a variety of disciplines, Rogers and Shoemaker (1971) stress the importance of relative advantage to the user, compatability with the user, complexity, trialability and observability. The appearance of similar terms in more recent theoretical work regarding teacher preferences of instructional materials suggests that Rogers and Shoemaker have been read by these writers.

Each of the aspects emphasized by them and listed here has a particular meaning that might mislead the reader unless explained. As Munby (1981) has noted, research can be confused by different meanings for the same term.

When the user is referred to, what is being discussed is the adopters, who would be the teachers, not the students. As has been mentioned, it is likely that at least a majority of materials selectors are teachers.

Relative advantage would refer to whether the teacher finds the innovation to be of help in that it would either make the teacher's job easier, or produce better results. The "pragmatic skeptic" as described by Doyle and Ponder (1977/78), would not be interested in change unless the advantage of that change were shown.

Complexity has at least two dimensions. It might be difficult to describe an innovation to a potential adopter because of its complexity. Complexity of implementation though, would refer to the difficulty of using the material once it is adopted. This could lead to discontinuation of use. Crandall (1977) suggests that complexity might be good at one stage of the change process, and bad at another. Zaltman (1977), points out that what is of concern is degree of perceived complexity in either theory or operation. The perception of the user, here the teacher, is what is most important.

Compatibility with the user could include both the question of teacher style and that teacher's awareness of style. Mehlinger (1975) says that what would make an innovation most compatible with the user would be a resemblance to what the teacher already has. If teachers do want what they are used to, then compatibility in their case would refer to either a strong resemblance to what they are used to, or to a derivation from a source similar to their own. Zaltman (1977), raises a similar issue when he requests that adopters be aware of a material's radicalness, in the sense of whether its point of origin is in its area of application. The creator of the innovation should be seen by the teacher to have been working in an environment similar to the teacher's classroom. Writers such as Elliott (undated), have recommended that materials be produced locally so as to decrease the teacher's sense of radicalness. Morgan on the other hand, states that teachers cannot be simultaneously classroom instructors and researchers. One of his assumptions is that the ability to do research is a requisite skill for a curriculum developer. If the teacher is the local developer of an innovation, that teacher is also a researcher, since a curriculum developer is also a researcher.

Trialability carries the idea that if an innovation does not work, or has undesirable consequences, it will not be difficult to cease the change. Zaltman (cited in Crandall, 1977), provides a similar concept in "status quo ante cost,"

which refers to the difficulty which must be risked relative to the reversibility of the innovation or return to a prior status quo. The change of an entire reading program from grades one to six would provide less trialibility than a change in readers at one grade level.

Observability refers to the ease with which the innovation or its outcome can be seen. Concreteness might refer to the teaching operation itself, in the sense that the teacher might prefer a change involving observable teaching procedures, to an innovation that requires for example that the teacher shows more "warmth" in the teaching process. Observable behavior such as choosing, writing, or speaking would be more concrete than changes in internal behavior such as "appreciation." Several writers stress the importance of observability or concreteness. Lortie makes the point (in Young, 1979) that instructional outcomes are concrete. Instructional materials would provide a concreteness to both the outcomes and the teaching procedures. Elliott and Lortie both state that teachers wish to have concrete procedures and are more concerned with how to teach than with what to teach. Zaltman (1977) is talking about the same concern when he recommends that an innovation be easy to communicate about, tangible, and concrete.

Rogers and Shoemaker (1971) are recommending attributes that make an innovation attractive to a potential adopter.

It might be argued that when a teacher selects or rejects an instructional material, a decision is being made whether to adopt an innovation. This would make the attributes already described as desirable for an innovation, also appropriate for an instructional material.

Several writers question the relevance of much research on change to education. Paul (1977) states that education is not as visible as agriculture, which served as the main model for Rogers and Shoemaker. In many cases in education, he points out, neither the procedures nor the outcomes are concrete.

Lieberman (1977) disagrees with the agriculture based change model for reasons different from Paul. He feels that teachers will only become interested in new ideas when they first have dealt with personal concerns and then classroom management problems. This would be consistent with the teacher's isolation and lack of peer contact. The teacher, he says, also differs from the agricultural worker in that he has a special interest in how to, rather than what to teach.

Most of these studies are hypothetical in nature and argue by analogie or metaphor. If indeed teachers prefer information from a source similar to their working environment, and are what Doyle and Ponder (1977/78), describe as "pragmatic skeptics," then they might be more attentive to experience-based educational literature than that which is hypothetical.

Educational Conjecture about Instructional Materials

Several authors have argued from personal experience particular points of view about instructional materials. Helinger (1975) states that teachers want what they are familiar with, which is what is available through commercial publishers (as opposed to locally developed materials). Anderson and Tomkins (1981) say that what has been familiar is the textbook, which according to them has always been dominant in the United States where inquiry materials were rarely used in the classroom. Cosh (1981) makes the same statement about British Columbia. Both sources suggest that the text has become the course. The common theme is that teachers prefer materials that are familiar. Whether frequency of occurrence of that comment is evidence of its accuracy remains to be demonstrated.

There has been very little empirical research that examines why teachers select particular instructional materials. If it is accepted that the question is worth asking, then the paucity of reports might be due to the lack of an appropriate investigative method.

Studies of Teacher Planning: Methodologies

The selection of instructional materials could be considered to be part of the planning process. Researchers in the area of teacher thinking frequently divide their topic

into preactive (pre-teaching), planning, and interactive thinking. There is some question as to whether interactive thinking includes a planning element. Information processing is a term that has been used to describe the quality of teacher thinking during instruction.

Perhaps for this reason, most planning researchers have studied preactive thinking, although Zahorik (1970), and Haig (1981), were both interested in links between preactive planning and interactive thinking and instruction.

Of the fourteen studies whose methods were examined, three involved senior high school, two junior high, and six elementary teachers. There did not appear to be any difference in methodologies when the grade groups were compared.

If the surveys of Zahorik and Taylor are excluded, the number of subjects studied in each case would be seven when rounded to the nearest whole number. This might be because there are ethnographic aspects to most of these investigations, which require direct observation, in-depth interviews, long term studies, content analyses of audio and videotapes, and other time consuming taks.

The greatest length of time was spent by Yinger (1978) whose research lasted five months. He worked with one teacher. Clark and Elmore (1979), who worked with five subjects, took several weeks to complete their research. Part of the time investigated was studied retroactively, since documents that

had been created by the teacher before the investigator arrived were examined after they had been written. Generally, there seems to have been an inverse relationship between the number of subjects and the length of time of the study.

Of the nine studies that looked at preactive planning, four taped the teacher during the planning session. None of these reported using the tapes for stimulated recall of what the teacher was thinking during preactive planning. The tapes were used not to assist teacher recall, but to make possible a transcription which could be analyzed by the researcher.

Several investigators did attempt to stimulate teacher recall by other methods. Metheny (1979) interviewed his subjects to discover why the teachers had answered his questionnaire as they did. Munby (1980) stimulated the subject's recall by showing her a chart summary of their first interview. Haig (1981) used a stream of consciousness written record that the teacher made while planning to remind the teacher of her thoughts during a subsequent interview. Both Yinger (1978) and Clark and Elmore (1979) used plan books, schedules and other documents to bring back to the teacher's mind what thoughts had occurred during planning.

Six research projects used either questionnaires or self-reports. Clark and Yinger (1979) and Haig (1981) had their teachers keep a record of their planning thoughts, with notations. In three cases the questionnaires were simply

given a content analysis. Three of the studies used the questionnaire or self-report record as the basis for an interview.

What we Know about Selection Criteria used by Teachers

What little information we have about teacher selection of instructional materials, is usually parenthetical to larger studies.

Six of twelve reports on teacher preactive thinking reviewed dealt partly with instructional materials. Toomey (1977) found that teachers who chose objectives first would select their materials in terms of whether they helped achieve these objectives. In the case of teachers for whom objectives were a low priority, materials were selected on the basis of whether the students might be able to learn something of their own determination from these materials. It is not clear whether the same differences would be found below the high school level.

Many investigations that did not directly refer to instructional materials did examine what teachers found to be important when they selected content or instructional activities. If instruction materials can be considered to be part of either activities or content, then desirable attributes of the latter might also apply to materials.

Taylor (1970) reported that what are most important to teachers when they plan are the students' needs and interests.

Clark, Yinger and Wildfong (1978) stated that their teachers were most concerned that the activities they chose would provide for student motivation and involvement. Second in importance was that they be of the right difficulty level for the students. Cognitive and affective outcomes were considered fourth and fifth.

If this information were found to apply to instructional materials, it would be safe to state that instructional materials are desirable if they reflect the needs, interests and abilities of students. If Toomey (1977) is correct, then teachers who choose objectives first in their planning may be exceptions to these rules, and may place student needs fairly low in their priorities.

An Alternative Approach to the Study of Teacher Selection Criteria

Ben-Peretz (1982) used Kelly's theory of personal constructs (1955) to assist her examination of curriculum materials. A construct is an idiosyncratic model of reality that can be expressed in terms of polarities. The construct of pupil grouping might for example be divided into individual as opposed to a class arrangement.

Ben-Peretz had a group of secondary teachers develop individually their constructs regarding curriculum materials by having them examine several pieces of curriculum materials

such as paragraphs from textbooks, illustrations, etc. The teacher was asked to while comparing any three of these items, say which item was unlike the other two, and what criteria was used to combine the two and differentiate the third. These bipolar criteria described constructs used by the teachers in evaluating curriculum materials.

Since there was a very large number of constructs, these were grouped into a smaller number of categories: content, teaching strategy, pupils' task, level of difficulty, cognitive demands, format, language, and class management. Differences were also found in the emphasis placed on different categories by different types of teachers. First and third year student teachers, teachers of advantaged and disadvantaged, and teachers of English as opposed to Semitic languages all had different priorities.

Ben-Peretz does not say how she selected the curriculum items. If the teachers were comparing materials that had no relevance to them, the experiment would have little meaning. There is some evidence (Ericsson and Herbert, 1980), that hypothetical questions do not probe actual thinking processes that have relevance to the situation being examined.

Nevertheless, the personal construct approach might enable us to examine what is not directly observable - the teacher's silent decision-making process. When combined with stimulated recall aided by taped or written records, it might

make possible the tracing of the methods by which a teacher decides which instructional material she might use.

Recommendations:

At present, we are not sure what criteria a teacher uses when she selects an instructional material. The very few studies that touch on this question seem to agree that student interest and ability are most important to the teacher. Ben-Peretz finds that what is stressed depends upon the experience and subject specialty, and ability level of the class taught by the teacher.

The only researcher I was able to discover who made materials choice a principal question was Ben-Peretz. Her subjects were exclusively secondary school teachers. The materials they compared were chosen by her, and may or may not have been perceived as relevant by the teachers.

Clark, Yinger and Wildfong (1978), and Toomey (1977), worked from a small sample and did find information relevant to the materials issue. The literature does not yet appear to contain a report of a study of elementary teachers that asks them why they chose the elementary materials that they are using.

Educational hypotheses and the personal experience of some writers suggest what we might find if we asked teachers to share their decision-making processes as they made these

decision. What seems logical does not alway find empirical support. The taping of teachers as they select, the use of these tapes in subsequent interviews to further probe sub-vocal processes, and the use of personal constructs, might all assist the researcher to discover which materials attributes the teacher found to be most attractive.

The term "teacher-proof materials" is both unrealistic and insulting to teachers. There is a great deal of evidence that teachers modify the characteristics or methods of use of a material to fit their perceived needs. It would be sensible to ask teachers what makes a material desirable, so that the designer would have a greater assurance that his creation would be used as he intended.

It would seem to be fair that the person who must use the instructional material should have a say in deciding the characteristics of it. The teacher, in other words, should be a partner with the curriculum designer, in materials development.

The literature has a great deal to say about what a teacher should look for in an instructional material. Generalizations can be found in the curriculum innovation reports that might have relevance to materials selection.

The most direct empirical information might be found by the stimulated recall and personal construct approaches.

A question that has not been examined here is why teachers are rarely asked what materials attributes they find most attractive. The answers might involve issues such as who has the power in the educational setting, and the confrontations between numerical and qualitative research.

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